## IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

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| **In re Application of:** | **Attorney Docket No.** |
| Saha *et al.* | 61169.00043 (P-2944) |
| **Application No.:** 10/728,496 | **Group Art Unit:** 2624 |
| **Filed:** December 5, 2003 | **Examiner:** Bernard Krasnic |

**Title:** Method for Measuring Structural Thickness from Low-Resolution Digital Images

### Electronic Proposal to the Examiner

**In the Claims:**

Please enter the claim amendments to claims 1, 14, 19, 22, 27 and 33, as shown. Please cancel claims 15, 23 and 24. Please add new claims 35-37. Your Examiner's Amendment the proposed claim listing below would replace all previously presented listings.

1. (Currently Amended)     A fuzzy distance transform-based computational method for analyzing digital images defining a volumetric region of an object from an image comprising:

    (a)  obtaining an image of the targeted object, comprising bone, bone marrow space, cortical bone, blood vessels ~~or lung airways~~ or combinations thereof;

    (b)  finding a plurality of points in the image to generate a fuzzy subset and computing a fuzzy distance transform (FDT) of the fuzzy subset, comprising sampling FDT values along a medial axis of a support of the fuzzy subset to estimate regional target object thickness distribution and assigning to a point in the fuzzy subset, its respective fuzzy distance from a complement of a support of the fuzzy subset;

    (c)  compiling a computer processed plot or revised image based upon the computed FDT; and

    (d)  displaying same in high resolution.

Claim 2. Cancelled.

3. (Previously Presented)     The method of claim 1, wherein the support comprises a set of all points in the fuzzy subset with a value greater than or equal to a support value.

4. (Previously Presented)    The method of claim 3, wherein the FDT is in digital cubic space.

Claims 5-7. Cancelled.

8. (Previously Presented)    The method of claim 1, wherein the target object is in or from an animal or human subject.

9. (Previously Presented)    The method of claim 1, wherein the image is obtained by magnetic resonance or computed tomography.

10. (Previously Presented)    The method of claim 1, whereby FDT values are sampled along a medial axis directly computed from the fuzzy subset.

11. (Previously Presented)    The method of claim 10, wherein the FDT is in digital cubic space.

12. Cancelled.

13. (Previously Presented)    The method of claim 11, wherein FDT is computed in digital cubic space of resolution of target object thickness or smaller.

14. (Currently Amended)    The method of ~~claim 1~~ claim 9, wherein the targeted object is in or from an animal or human subject.

Claim 15. Cancelled.

16. (Previously Presented)    The method of claim 3, further comprising applying one or more additional steps consisting of skeletonizing, feature extracting; analyzing morphological or shape-based object, computing regional object depth; calculating average or regional object thickness distribution; and local scaling.

17. (Currently Amended)    A fuzzy distance transform-based computational method for ~~evaluating or diagnosing bone disease in a subject by~~ analyzing digital images defining at least one volumetric region of bone from or in the subject,  the method comprising:

    (a) obtaining an image of targeted bone region;

    (b) finding a plurality of points in the image to generate a fuzzy subset and computing a fuzzy distance transform (FDT) of the fuzzy subset, comprising sampling FDT values along a medial axis of a support of the fuzzy subset to estimate regional target object thickness distribution and assigning to a point in the fuzzy subset its respective fuzzy distance from a complement of a support of the fuzzy subset;

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(c) compiling a computer processed plot or revised image based upon the computed FDT; and

(d) displaying same in high resolution.

Claim 18. Cancelled.

19. (Currently Amended)    The method of ~~claim 18~~ claim 17, wherein the support comprises a set of all points in the fuzzy subset with a value greater than or equal to a support value.

Claims 20-21. Cancelled.

22. (Currently Amended)    The method of claim 17, further comprising diagnosing or evaluating ~~selecting a therapy based on the diagnosis or evaluation of~~ bone disease in the subject.

Claims 23-24. Cancelled.

25. (Previously Presented)    The method of claim 1, further comprising calculating structural thickness of an object from the digital image, wherein a dynamic programming-based algorithm using a plurality of points in a digital image of a target object is used for generating the fuzzy subset, and for calculating the FDT of the fuzzy subset, the FDT terminating in a finite number of steps.

Claim 26. Cancelled.

claim 25   /BK/ 3-10-2010

27. (Currently Amended)    The method of ~~claim 26~~ claim 17, wherein the support comprises a set of all points in the fuzzy subset with a value greater than or equal to a support value.

Claim 28-30. Cancelled.

31. (Previously Presented)    The method of claim 17, further comprising calculating structural thickness of an object from the digital image, wherein a dynamic programming-based algorithm using a plurality of points in a digital image of a target object is used for generating the fuzzy subset, and for calculating the FDT of the fuzzy subset, the FDT terminating in a finite number of steps.

Claim 32. Cancelled.

33. (Currently Amended)    The method of ~~claim 32~~ claim 31, wherein the support comprises a set of all points in the fuzzy subset with a value greater than or equal to a support value.

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34. (Previously Presented)    The method of claim 33, wherein the FDT is in digital cubic space.

35. (New) The method of claim 22, further comprising selecting a therapy based on the diagnosis or evaluation of bone disease in the subject.

36. (New) The method of claim 35, further comprising administering the therapy to the subject.

37. (New) The method of claim 36, wherein the evaluation further comprises monitoring a progression or regression of bone disease in the subject, during or at one or more times after administering the selected therapy.